INTERNATIONAL SEARCH REPORT

International application No.
PCT/US03/31987

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 23/02; H05K 7/20
US CL : 257/678,685-687,706,712,713, 720, 723,724,738,773,778-780,784,787,790,796; 361/704,705,707,709-711

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 257/678,685-687,706,712,713, 720, 723,724.738,773,778-780,784,787,790,796; 361/704,705,707,709-711

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 6,414,381A (Takeda) 2 July 2002, col. 8 lines 35-67, col. 10 lines 15-67, and col. 11 lines 1-67.	1-9,11, 12, 15-17,19-34,38-40,43-55,57-64,66-70,72-90, 93-103,105-109, 112,113, 115-128, 131-147, 150, 151,153-168,174-176,178-188,190-200
Y,P	US 5,994,166A (Akram et al.) 30 November 1999, col. 7 lines 27-67 and col. 8 lines 1-65.	10,18,41,71,169-173,189
Y,P	US 6,649,448A (Tomihara) 18 November 2003, col. 7 lines 50-65, col. 8 1-65, and col. 9 lines 1-67.	37,42,65,104,114,152, 177
Y,P	US 6,734,539A (Degani et al.) 11 May 2004, col. 1 lines 25-60 and col. 5 lines 15-65.	56,91,92,129,130
Y,P	US 6,552,423A (Song et al.) 22 April 2003, col. 3 lines 52-63.	13,14,35,36,110,111,148,149.

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
01 June 2004 (01.06.2004)

Date of mailing of the international search report
16 JUN 2004

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Facsimile No. (703) 305-3230

Authorized officer
Alonzo Chambliss

Telephone No. 571 272-1927

Form PCT/ISA/210 (second sheet) (July 1998)